AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listing, of claims in the application:

1. (currently amended) Process for irradiating products by means of high energy X-ray beam source (1) in an installation having an irradiation chamber (2), said process comprising the following steps, controlled by controlling means:

determining the density of the products to be irradiated,

in order to irradiate said products as a stack, predetermining, on the basis of said density, the optimal size of the product stack able to optimize the throughput of the installation and/or the dose uniformity ratio (DUR),

in the irradiation chamber (2), loading products as a stack of optimal size onto rotation means (3) located in front of the X-ray beam source (1),

while rotating the rotation means around a rotation axis (10), irradiating said products from a lateral side of said product stack without using a collimator.

2. (currently amended) The process according to claim 1, characterized in that ~~the~~ rotation speed of the rotation means in front of the ~~radiation~~ X-ray beam source is maintained constant.

3. (previously presented) The process according to claim 2, characterized in that the rotation speed of the rotation means in front of the radiation beam source is maintained constant by the action of the controlling means at a value depending upon predefined parameters.

4. (currently amended) The process according to claim 1, ~~adapted for irradiating~~ wherein the products are carried on pallets~~, characterized in that~~ and the stack is formed by at least two ~~contigous~~ contiguous pallets (4',4").

5. (currently amended) The process according to claim 4~~, characterized in that~~ wherein the stack comprises at least four product pallets (4', 4", 4"',4.sup.IV).

6. (currently amended) The process according to claim 1~~, characterized in that in the stack~~ wherein the pallets in the stack are in a plane perpendicular to the rotation axis of the rotation means.

7. (currently amended) The process according to claim 5~~, characterized in that in the stack~~ wherein the four ~~of the~~ product pallets (4', 4", 4"',4.sup.IV) to be irradiated are rectangular product pallets and form together a square base with an open column (6) at the centre of the square base.

8. (currently amended) The process according to claim 7, ~~characterized in that in the stack~~ wherein the centre of the square (9) coincides with the rotation axis (10) of the rotation means.

9. (currently amended) The process according to claim 5~~, characterized in that in the stack~~ wherein the four ~~of the~~ product pallets to be irradiated are rectangular pallets having each at least one corner (7',7",7"',7.sup.IV), and said four product pallets are arranged in such a way that said corner of each pallet coincides in a contact point (8) with one corner of the other three pallets.

10. (currently amended) The process according to claim 9~~, characterized in that in the stack~~ wherein the contact point (8) is located on the rotation axis (10) of the rotation means (3).

11. (previously presented) The process according to claim 1, adapted for irradiating products under bulk form or under the form of small parcels, characterized

in that the product stack is maintained in at least one cylindrical container (11) having an internal volume.

12. (previously presented) The process according to claim 11, characterized in that said products are arranged in said cylindrical container (11) so as to fill the total internal volume of said cylindrical container (11).

13. (previously presented) The process according to claim 11, characterized in that said products are arranged in said cylindrical container (11) so as to let an open column along the center axis of the cylindrical container (11).

14. (previously presented) The process according to claim 11, characterized in that said cylindrical container (11) is selected from a set of cylindrical containers such as tons or cylindrical baskets, having a diameter near to said determined optimal size.

15. (previously presented) The process according to claim 1, characterized in that the irradiation of the products is performed by batches of products of similar densities.

16. (currently amended) Apparatus for irradiating products, said apparatus comprising:

a high energy X-ray beam source (1), for irradiating the products from a lateral side with a beam directed along a first direction substantially perpendicular to said lateral side, and scanned along a second direction substantially perpendicular to said first direction,

an irradiation chamber (2), where irradiation of the products can be performed, said irradiation chamber comprising rotation means (3) for rotating said products around a rotation axis (10) parallel to said second direction,

~~rotation means for rotating said products~~ said rotating taking place in front of said X-ray beam source (1) at a constant rotation speed, ~~around said rotation axis,~~ during irradiation, said rotation means comprising means for receiving the products;

said apparatus being characterized in that said apparatus does not comprise a collimator, and said means for receiving the products are adapted to receive products loaded thereon as a stack the size of which is variable depending on the density of said products.

17. (previously presented) The apparatus according to claim 16, adapted to receive a product stack comprising products carried on pallets.

18. (currently amended) The apparatus according to claim 17, wherein the ~~rotations means are adapted to receive a~~ product stack ~~comprising~~ comprises at least two ~~contigous~~ contiguous pallets (4',4").

19. (currently amended) The apparatus according to claim 17, wherein the ~~rotation means are adapted to receive a~~ product stack ~~comprising~~ comprises at least four product pallets (4', 4", 4"',4.sup.IV).

20. (currently amended) The apparatus according to claim 16~~, wherein the rotation means are adapted to receive a product stack~~ wherein said product pallets are arranged relatively to each other in the same plane perpendicular to the rotation axis of the rotation means.

21. (currently amended) The apparatus according to claim 19~~, characterized in that the rotation means are adapted to receive a stack~~ wherein the at least four ~~of the~~ product pallets (4', 4", 4"',4.sup.IV) to be irradiated are rectangular product pallets and form together a square base with an open column (6) at the centre of the square base.

22. (currently amended) The apparatus according to claim 21~~, characterized in that the rotation means are adapted to receive a stack~~ wherein the centre of the square (9) coincides with the rotation axis (10) of the rotation means.

23. (currently amended) The apparatus according to claim 19~~, characterized in that the rotation means are adapted to receive a stack~~ wherein the at least four ~~of the~~ product pallets to be irradiated are rectangular pallets having each at least one corner (7',7'',7''',7.sup.IV), and said four product pallets are arranged in such a way that said corner of each pallet coincides in a contact point (8) with one corner of the other three pallets.

24. (currently amended) The apparatus according to claim 23~~, characterized in that the rotation means are adapted to receive a stack~~ wherein the contact point (8) is located on the rotation axis (10) of the rotation means (3).

25. (currently amended) The apparatus according to claim 16~~, characterized in that the rotation means are adapted to receive a product stack~~ wherein the products are under bulk form or under the form of small parcels.

26. (currently amended) The apparatus according to claim 16~~, characterized in that the rotation means are adapted to receive a product stack~~ wherein the product stack is maintained in at least one cylindrical container (11) such as a ton or a cylindrical basket.

27. (previously presented) The apparatus according to claim 16, characterized in that the means in the rotation means for receiving the product stack comprise a turntable.

28. (previously presented) The apparatus according to claim 16, characterized in that it further comprises controlling means for controlling the overall operating state of the apparatus.

29. (previously presented) The apparatus according to claim 28, characterized in that said controlling means are able to control the rotation speed of the rotation means.

30. (previously presented) The apparatus according to claim 29, characterized in that said controlling means are able to maintain constant the rotation speed of the rotation means, the value of said rotation speed being dependent upon predefined parameters.

31. (previously presented) The apparatus according to claim 16, it can operate for irradiation of the products by batches of products of similar densities.